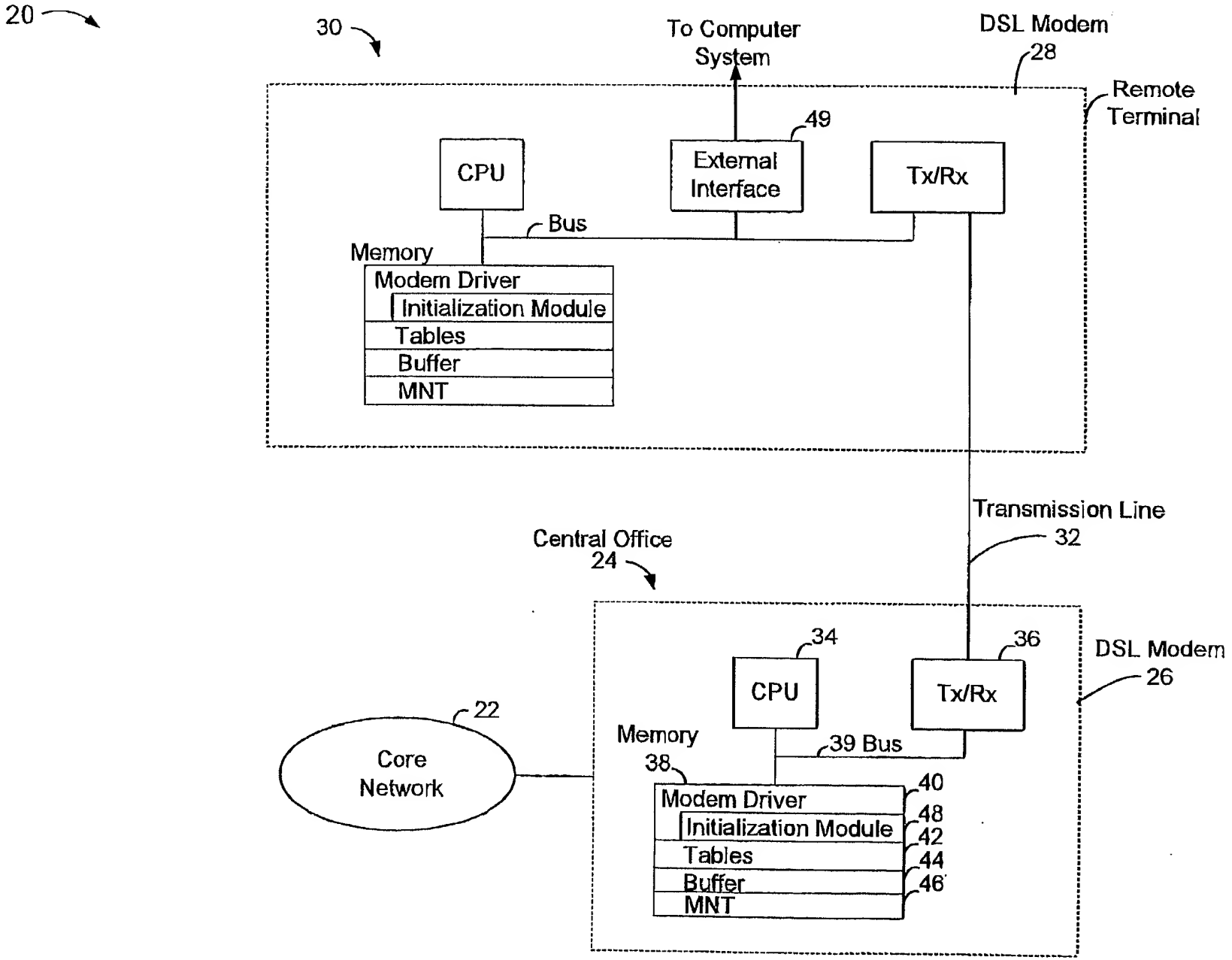

20
30
To Computer System
DSL Modem
28
Remote Terminal
49
CPU
External Interface
Tx/Rx
Bus
Memory
Modem Driver
Initialization Module
Tables
Buffer
MNT
Transmission Line
32
Central Office
24
34
36
DSL Modem
26
CPU
Tx/Rx
22
Core Network
Memory
38
39 Bus
40
Modem Driver
48
Initialization Module
42
Tables
44
Buffer
46
MNT

FIG. 1

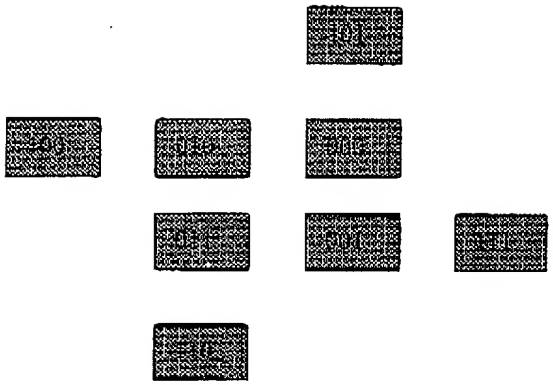
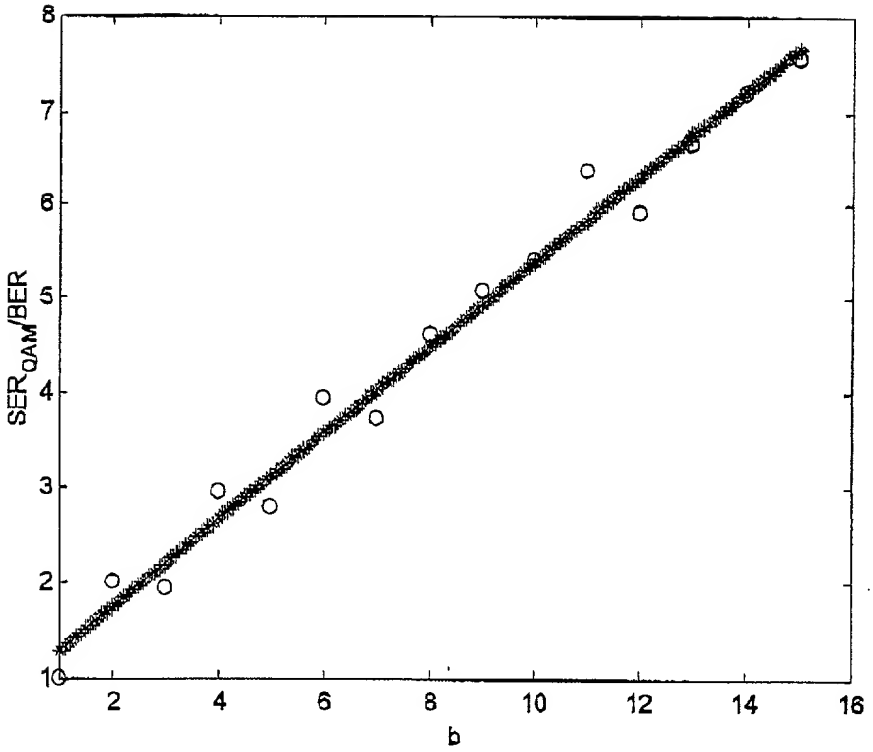


FIG. 2



$1/\omega(b)$

FIG. 3

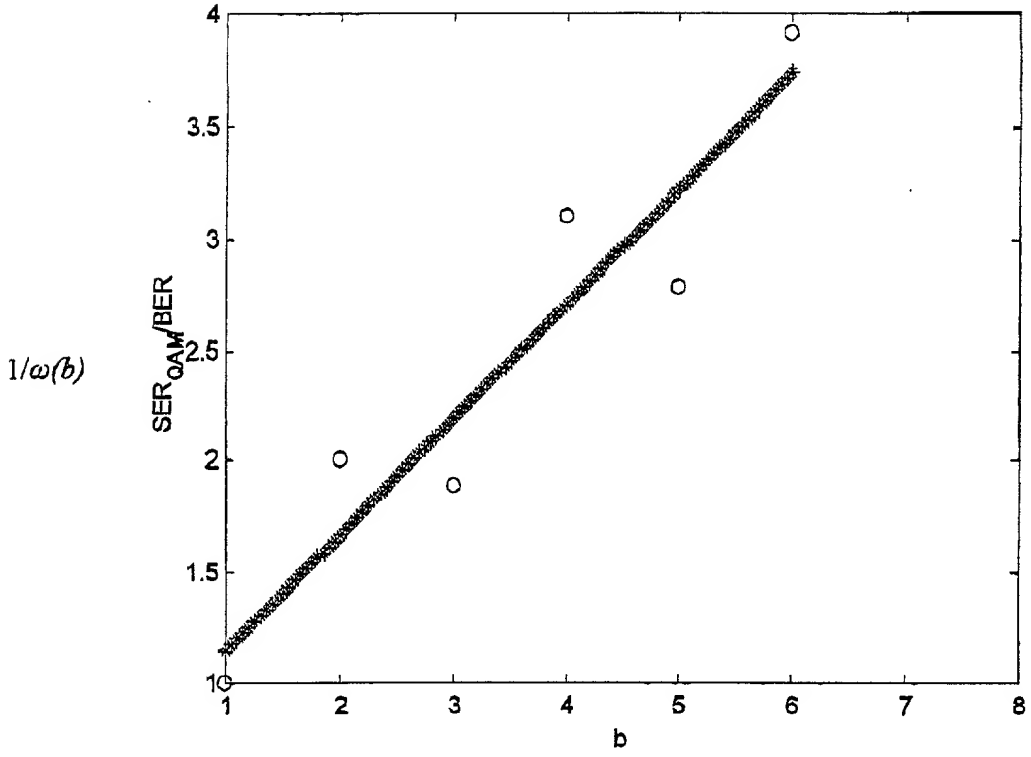


FIG. 4

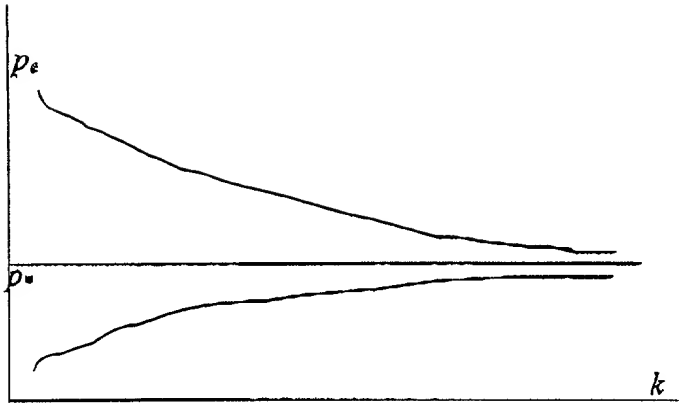


FIG. 6

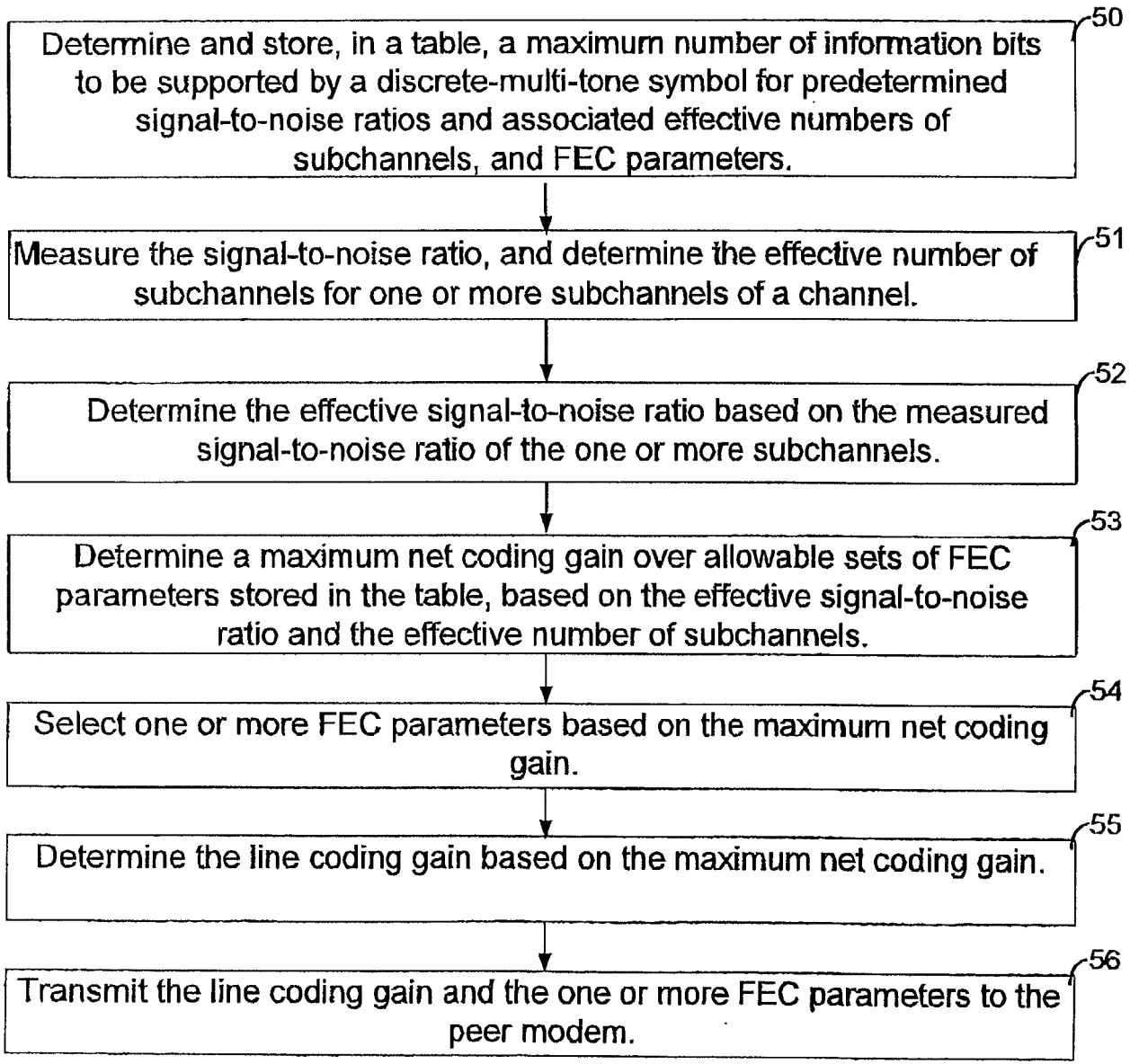

Determine and store, in a table, a maximum number of information bits to be supported by a discrete-multi-tone symbol for predetermined signal-to-noise ratios and associated effective numbers of subchannels, and FEC parameters.
50
Measure the signal-to-noise ratio, and determine the effective number of subchannels for one or more subchannels of a channel.
51
Determine the effective signal-to-noise ratio based on the measured signal-to-noise ratio of the one or more subchannels.
52
Determine a maximum net coding gain over allowable sets of FEC parameters stored in the table, based on the effective signal-to-noise ratio and the effective number of subchannels.
53
Select one or more FEC parameters based on the maximum net coding gain.
54
Determine the line coding gain based on the maximum net coding gain.
55
Transmit the line coding gain and the one or more FEC parameters to the peer modem.
56

FIG. 5

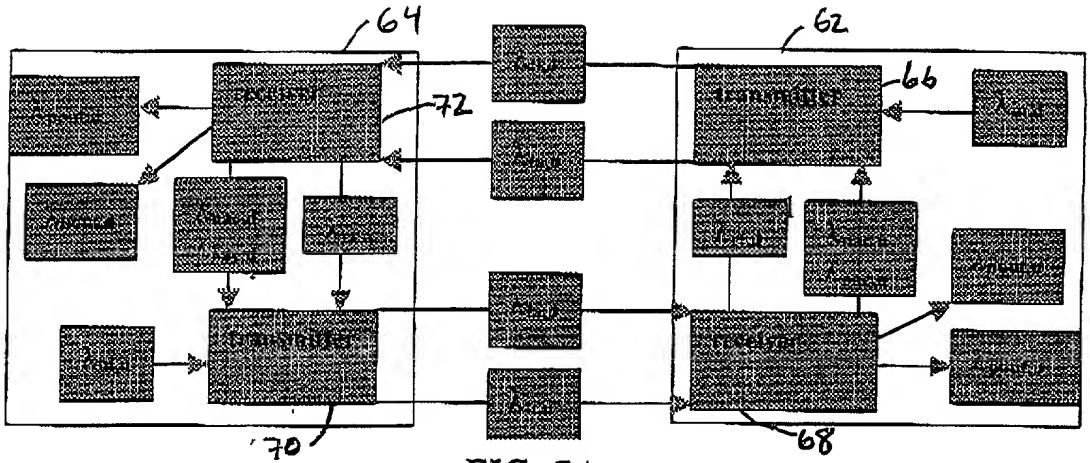


FIG. 7A

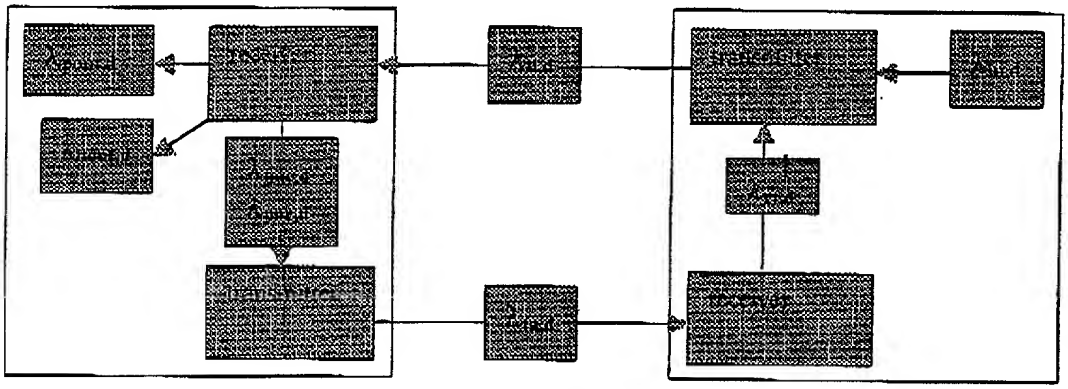


FIG. 7B

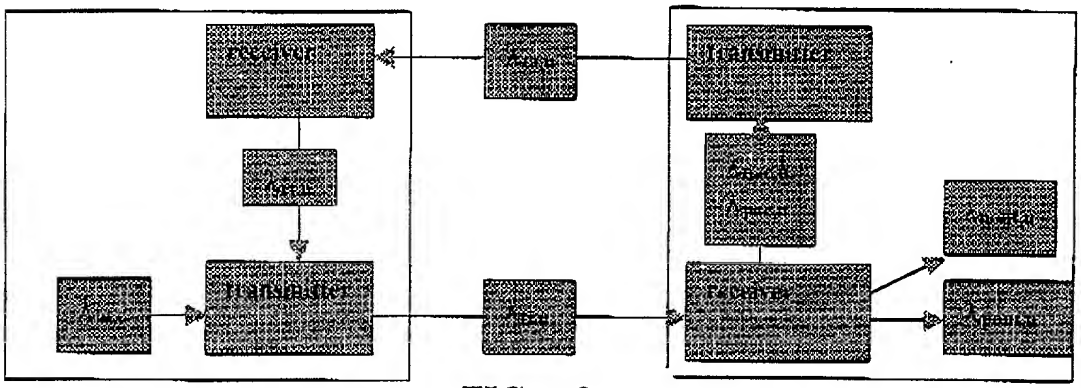


FIG. 7C

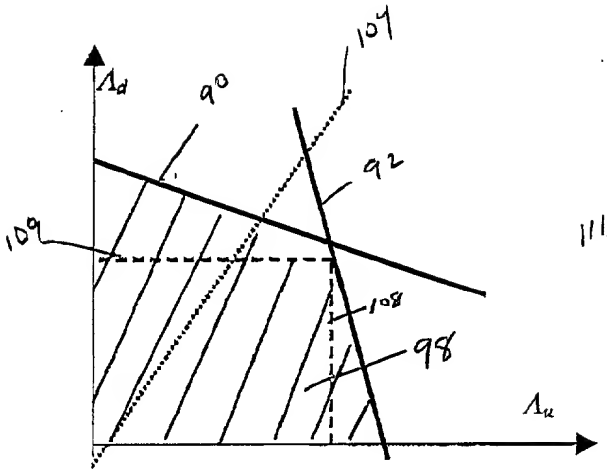

Λ_d
90
107
92
109
108
98
Λ_u

FIG. 8A

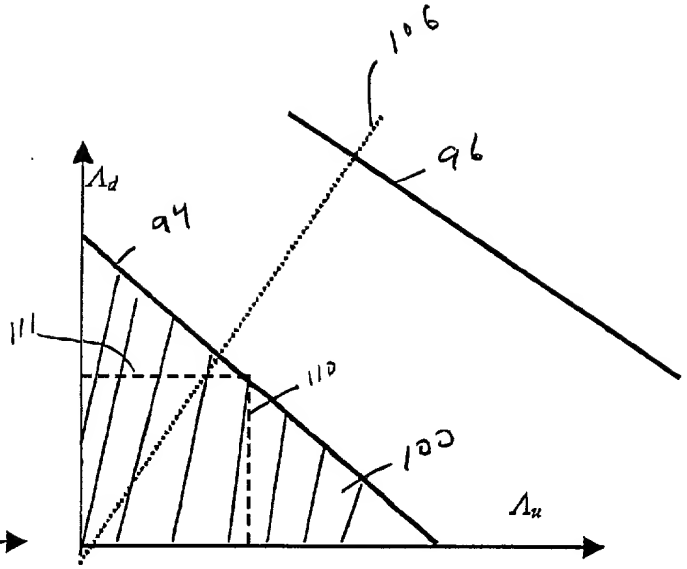

106
96
Λ_d
94
111
110
100
Λ_u

FIG. 8B

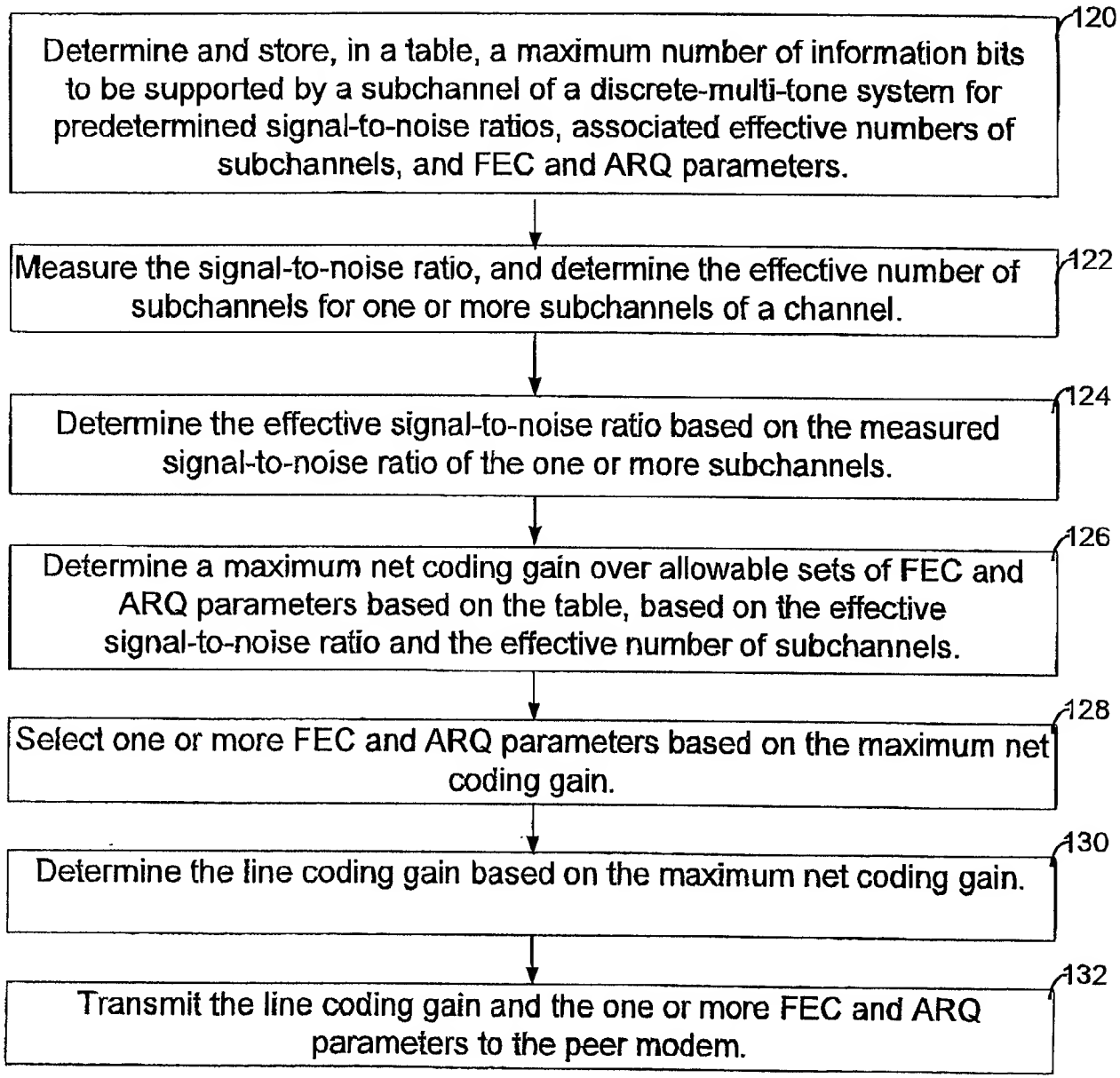

Determine and store, in a table, a maximum number of information bits to be supported by a subchannel of a discrete-multi-tone system for predetermined signal-to-noise ratios, associated effective numbers of subchannels, and FEC and ARQ parameters.
120
Measure the signal-to-noise ratio, and determine the effective number of subchannels for one or more subchannels of a channel.
122
Determine the effective signal-to-noise ratio based on the measured signal-to-noise ratio of the one or more subchannels.
124
Determine a maximum net coding gain over allowable sets of FEC and ARQ parameters based on the table, based on the effective signal-to-noise ratio and the effective number of subchannels.
126
Select one or more FEC and ARQ parameters based on the maximum net coding gain.
128
Determine the line coding gain based on the maximum net coding gain.
130
Transmit the line coding gain and the one or more FEC and ARQ parameters to the peer modem.
132

FIG. 9

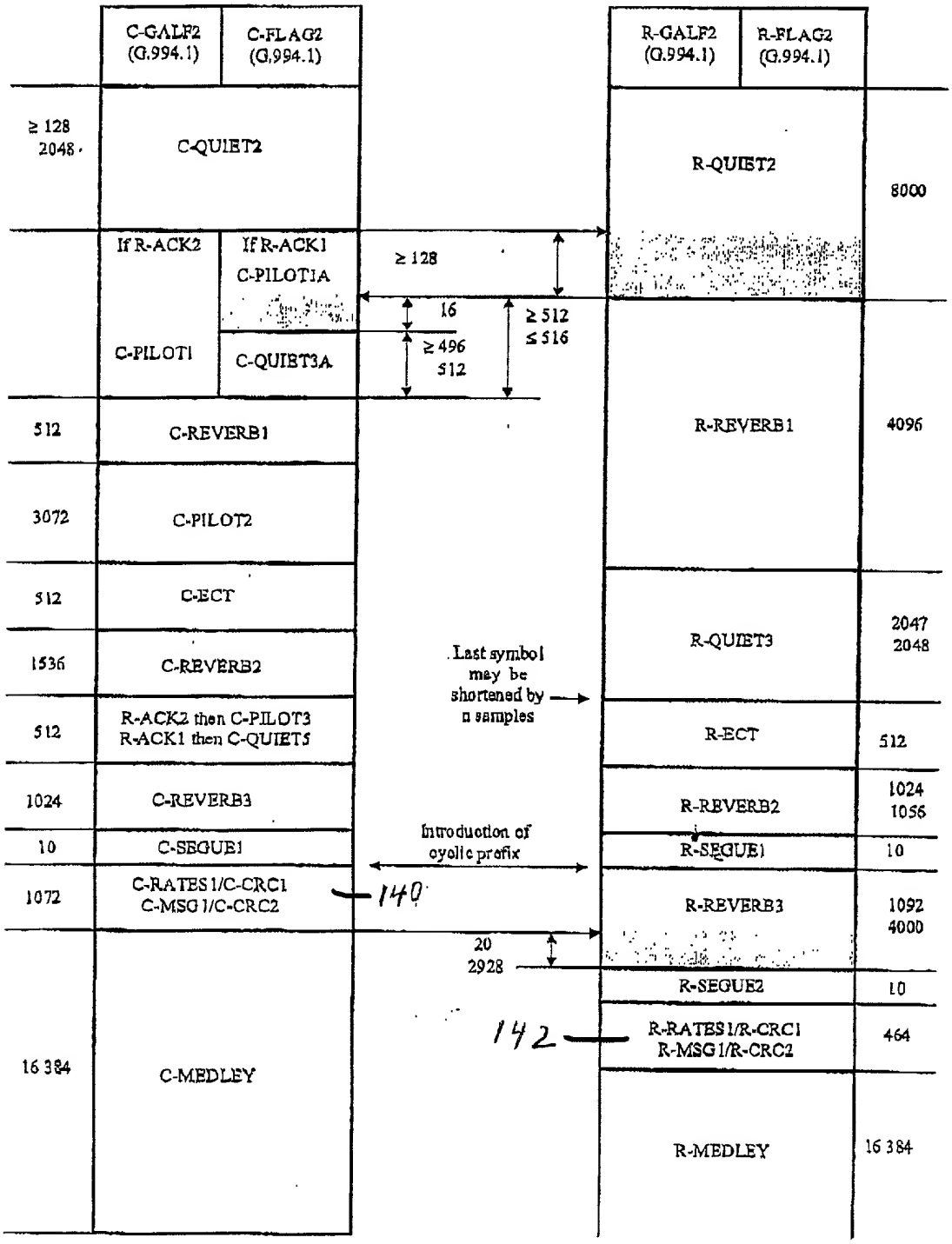

C-GALF2 (G.994.1)
C-FLAG2 (G.994.1)
R-GALF2 (G.994.1)
R-FLAG2 (G.994.1)
≥ 128 2048
C-QUIET2
R-QUIET2
8000
If R-ACK2
If R-ACK1
C-PILOT1A
≥ 128
16
≥ 512 ≤ 516
C-PILOT1
C-QUIET3A
≥ 496 512
512
C-REVERB1
R-REVERB1
4096
3072
C-PILOT2
512
C-ECT
R-QUIET3
2047 2048
1536
C-REVERB2
Last symbol may be shortened by n samples
512
R-ACK2 then C-PILOT3
R-ACK1 then C-QUIET5
R-ECT
512
1024
C-REVERB3
R-REVERB2
1024 1056
10
C-SEGUE1
Introduction of cyclic prefix
R-SEGUE1
10
1072
C-RATES1/C-CRC1
C-MSG1/C-CRC2
140
R-REVERB3
1092 4000
20
2928
R-SEGUE2
10
142
R-RATES1/R-CRC1
R-MSG1/R-CRC2
464
16 384
C-MEDLEY
R-MEDLEY
16 384

Fig. 10A

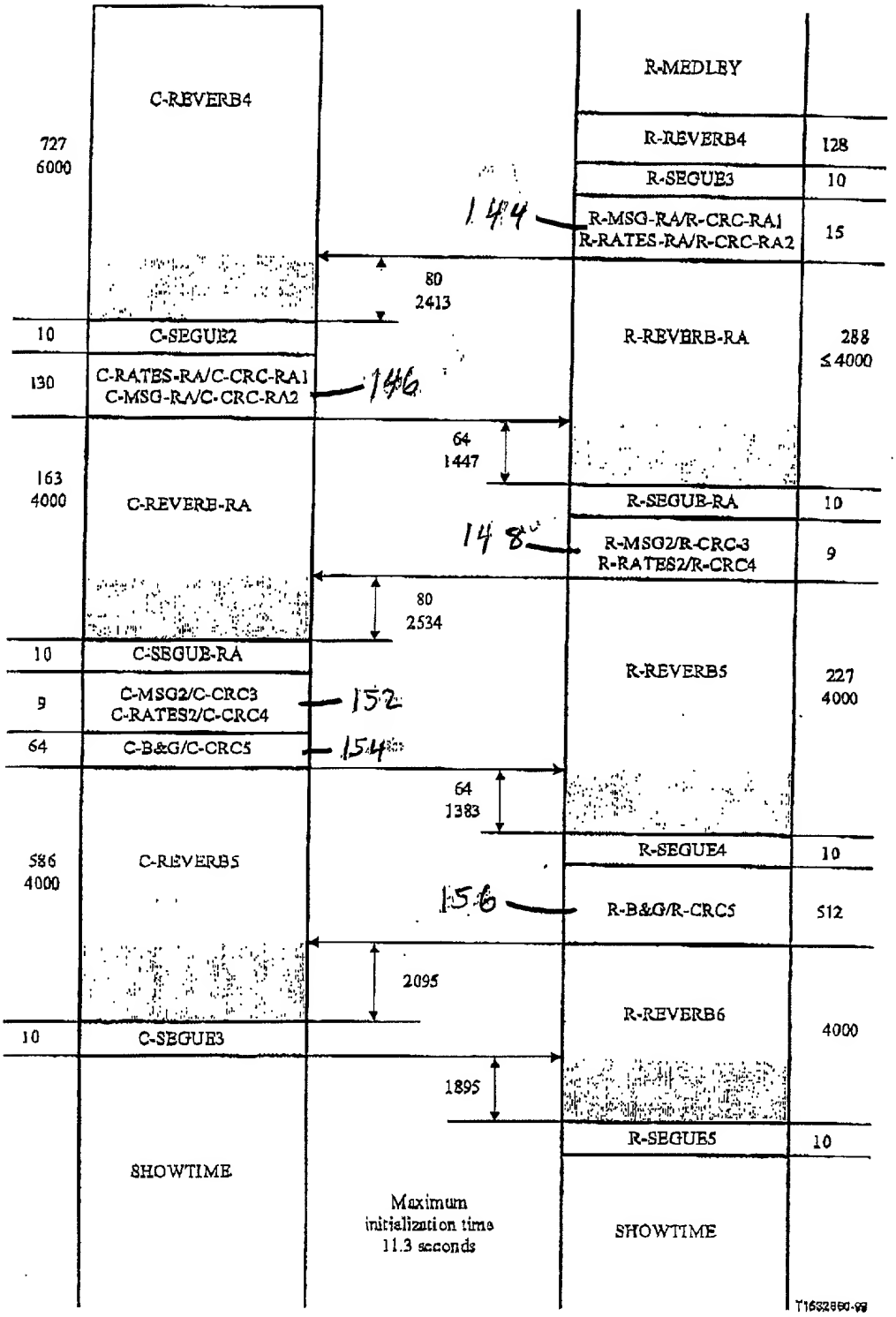

C-REVERB4
727
6000
80
2413
10
C-SEGUE2
130
C-RATES-RA/C-CRC-RA1
C-MSG-RA/C-CRC-RA2
146
64
1447
163
4000
C-REVERB-RA
80
2534
10
C-SEGUE-RA
9
C-MSG2/C-CRC3
C-RATES2/C-CRC4
152
64
C-B&G/C-CRC5
154
64
1383
586
4000
C-REVERB5
2095
10
C-SEGUE3
1895
SHOWTIME
Maximum
initialization time
11.3 seconds
R-MEDLEY
R-REVERB4
128
R-SEGUE3
10
144
R-MSG-RA/R-CRC-RA1
R-RATES-RA/R-CRC-RA2
15
R-REVERB-RA
288
≤ 4000
R-SEGUE-RA
10
148
R-MSG2/R-CRC-3
R-RATES2/R-CRC4
9
R-REVERB5
227
4000
R-SEGUE4
10
156
R-B&G/R-CRC5
512
R-REVERB6
4000
R-SEGUE5
10
SHOWTIME
T1652860-98

Fig. 10B